

Name: _____

Date: _____

Algebra 2 CC1: Using the Discriminant $(b^2 - 4ac)$

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|--|--|----------------------------------|
| $b^2 - 4ac$ is positive, but NOT a perfect square. | | What is the nature of the roots? |
| $b^2 - 4ac$ is positive, and a perfect square. | | What is the nature of the roots? |
| $b^2 - 4ac$ is equal to zero. | | What is the nature of the roots? |
| $b^2 - 4ac$ is NEGATIVE | | What is the nature of the roots? |

You have to familiarize yourself with this chart!!!

1) The roots of the equation $5x^2 - 2x + 1 = 0$ are

- (1) real, rational, and unequal
- (2) real, rational, and equal
- (3) real, irrational, and unequal
- (4) imaginary

2) The roots of the equation $x^2 - 5x + 1 = 0$ are

- (1) real, rational, and unequal
- (2) real, rational, and equal
- (3) real, irrational, and unequal
- (4) imaginary

3) Which equation has imaginary roots?

- (1) $x^2 - 1 = 0$
- (2) $x^2 - 2 = 0$
- (3) $x^2 + x + 1 = 0$
- (4) $x^2 - x - 1 = 0$

4) Which equation has roots that are real, rational, and unequal?

(1) $x^2 + x + 1 = 0$ (3) $x^2 - 4 = 0$

(2) $x^2 - 4x + 4 = 0$ (4) $x^2 - 2 = 0$

5) Find all values of k such that the equation $3x^2 - 2x + k = 0$ has imaginary roots.

6) Use the discriminant to determine all values of k that would result in the equation $x^2 - kx + 4 = 0$ having equal roots.

7) The roots of the equation $ax^2 + 4x = -2$ are real, rational, and equal when a has a value of

(1) 1 (3) 3

(2) 2 (4) 4

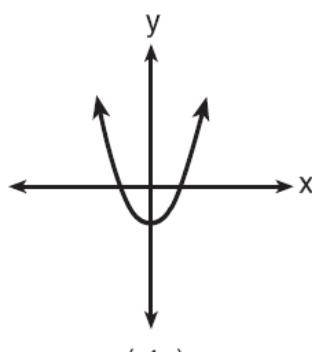
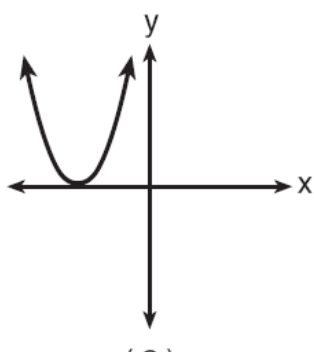
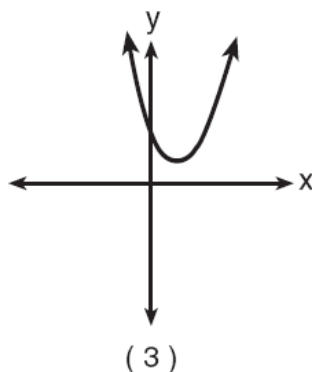
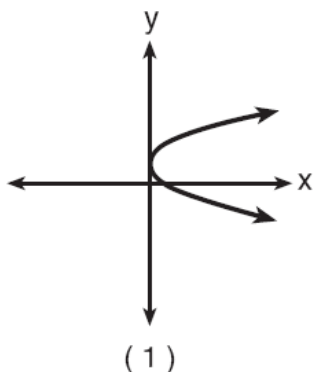
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|---|---------------------|----------------------------|
| $b^2 - 4ac$ is positive, but NOT a perfect square. | Nature of the roots | Rough sketch of the graph: |
| $b^2 - 4ac$ is positive, and a perfect square. | Nature of the roots | Rough sketch of the graph: |
| $b^2 - 4ac$ is equal to 0. | Nature of the roots | Rough sketch of the graph: |
| $b^2 - 4ac$ is negative. | Nature of the roots | Rough sketch of the graph: |

8)

If the roots of $ax^2 + bx + c = 0$ are real, rational, and equal, what is true about the graph of the function $y = ax^2 + bx + c$?

- (1) It intersects the x -axis in two distinct points.
- (2) It lies entirely below the x -axis.
- (3) It lies entirely above the x -axis.
- (4) It is tangent to the x -axis.

- 9) If zero is the value of the discriminant of the equation $ax^2 + bx + c = 0$, which graph best represents $y = ax^2 + bx + c$?



- 10) Which statement must be true if a parabola represented by the equation $y = ax^2 + bx + c$ does *not* intersect the x -axis?
- (1) $b^2 - 4ac = 0$
 - (2) $b^2 - 4ac < 0$
 - (3) $b^2 - 4ac > 0$, and $b^2 - 4ac$ is a perfect square.
 - (4) $b^2 - 4ac > 0$, and $b^2 - 4ac$ is not a perfect square.
- 11) Which is a true statement about the graph of the equation $y = x^2 - 7x - 60$?
- (1) It is tangent to the x -axis.
 - (2) It does not intersect the x -axis.
 - (3) It intersects the x -axis in two distinct points that have irrational coordinates.
 - (4) It intersects the x -axis in two distinct points that have rational coordinates.